

What is claimed is:

1. A method of determining a modulus-of-elasticity-analog value of a moving web material, the method comprising steps of:
 - a) determining a first web-tension-analog value of the moving web material in a first span,
 - b) determining a first web-velocity-analog value of the moving web material in the first span,
 - c) determining a second web-tension-analog value of the moving web material in a second span,
 - d) determining a second web-velocity-analog value of the moving web material in the second span, and
 - e) determining the modulus-of-elasticity-analog value of the moving web material according to the first web-tension-analog value, the second web-tension-analog value, the first web-velocity-analog value, and the second web-velocity-analog value.
2. The method according to claim 1 wherein the first web-tension-analog value and the first web-velocity-analog value are determined at a first location.
3. The method according to claim 1 further comprising a step of determining a flow-rate-analog value of the moving web material according to the modulus-of-elasticity-analog value and either the first web-tension-analog value and the first web-velocity-analog value, or the second web-tension-analog value and the second web-velocity-analog value.
4. The method according to claim 3 further comprising steps of:
 - a) determining an unwinding web velocity-analog value of the moving web material, and
 - b) determining a wound-in-tension-analog value of the moving web material according to the flow-rate-analog value, the modulus-of-elasticity-analog value and the unwinding web velocity-analog value.
5. The method according to claim 3 comprising a step of determining a flow-rate-analog value whenever there is a change in any value selected from either the group consisting of: the first web-tension-analog value, the first web-velocity-analog value and combinations thereof, or the group consisting of: the second web-tension-analog value, the second web-velocity-analog value, and combinations thereof.
6. The method according to claim 1 wherein the first web-tension-analog value is determined for a first web portion in a first span, and the second web-tension-analog value is determined for the first web portion in a second span.
7. The method according to claim 1 further comprising a step of determining a modulus-of-elasticity-analog value whenever there is a change in any value selected from the group consisting of: the first web-tension-analog value, the first web-velocity-analog value, the second web-tension-analog value, the second web-velocity-analog value, and combinations thereof.

8. The method according to claim 1 wherein the modulus-of-elasticity-analog value is determined at predetermined time intervals.
9. The method according to claim 1 wherein the modulus-of-elasticity-analog value is determined after the handling of a predetermined length of moving web material.
10. The method according to claim 1 wherein the modulus-of-elasticity-analog value is determined according to a rotational position of the roll.
11. The method according to claim 1 comprising steps of:
 - a) unwinding the moving web material from a roll of web material,
 - b) associating at least a first web portion with a roll coordinate location,
 - c) determining a modulus-of-elasticity-analog value for at least the first web portion, and
 - d) associating the modulus-of-elasticity-analog value determined for the first web portion with the roll coordinate location associated with the first web portion.
12. The method according to claim 11 further comprising steps of:
 - a) associating a time value with the determined modulus-of-elasticity-analog value, and
 - b) storing at least the modulus-of-elasticity-analog value with the associated time value.
13. The method according to claim 11 further comprising steps of:
 - a) determining a flow-rate-analog value for the first web portion, and
 - b) associating the flow-rate-analog value for the first web portion with the roll coordinate location of the first web portion.
14. The method according to claim 13 further comprising steps of:
 - a) determining an unwinding web velocity-analog value for the first web portion,
 - b) determining a wound-in-tension-analog value for the first web portion, and
 - c) associating the unwinding web velocity-analog value and the wound-in-tension-analog value with the roll coordinate location of the first web portion.
15. The method according to claim 14 further comprising a step of storing a data value with an associated registration value, the data value selected from the group consisting of: the modulus-of-elasticity-analog value, the flow-rate-analog value, the wound-in-tension-analog value, and combinations thereof.
16. The method according to claim 14 comprising at least partially filtering at least one value selected from the group consisting of: the first web-tension-analog value, the second web-tension-analog value, the first web-velocity-analog value, the second web-velocity-analog value, the modulus-of-elasticity-analog value, the flow-rate-analog value, and combinations thereof.
17. The method according to claim 16 including high frequency filtering of at least the first web-tension-analog value measurement.

18. A method of determining a modulus-of-elasticity-analog value of a moving web material, the method comprising steps of:

- a) determining a first web-tension-analog value of the moving web material in a first span,
- b) determining a first web-velocity-analog value of the moving web material in the first span,
- c) determining a second web-tension-analog value of the moving web material in a second span,
- d) determining a second web-velocity-analog value of the moving web material in the second span,
- e) determining a flow-rate-analog value of the moving web material according to the first web-tension-analog value, the second web-tension-analog value, the first web-velocity-analog value, and the second web-velocity-analog value, and
- f) determining the modulus-of-elasticity-analog value according to the flow-rate-analog value and either the first web-tension-analog value and the first web-velocity-analog value, or the second web-tension-analog value and the second web-velocity-analog value.

19. The method according to claim 18 further comprising steps of:

- a) determining an unwinding web velocity-analog value for the moving web material, and
- b) determining a wound-in-tension-analog value for the moving web material according to the modulus-of-elasticity-analog value, the flow-rate-analog value and the unwinding web velocity-analog value.

20. A method of determining a modulus-of-elasticity-analog value of a moving web material, the method comprising steps of:

- a) determining a first web-tension-analog value of a first portion of the moving web material in a first span,
- b) determining a first web-velocity-analog value of the first portion of the moving web material in the first span,
- c) determining a second web-tension-analog value of the first portion of the moving web material in a second span,
- d) determining a second web-velocity-analog value of the first portion of the moving web material in the second span,
- e) determining the modulus-of-elasticity-analog value of the moving web material according to at least the first web-tension-analog value, the second web-tension-analog value, the first web-velocity-analog value, and the second web-velocity-analog value, and
- f) determining a flow-rate-analog value according to at least the first web-tension-analog value, the second web-tension-analog value, the first web-velocity-analog value, and the second web-velocity-analog value.